

adoption of new technology, a reflection of what may be called the inventive spirit of the age, also accelerated industrialization in the United States. Inventors flooded the U.S. Patent Office with applications, raising the number from an average of 1,000 per year in the 1850s to 20,000 per year in the 1890s.

Some notable inventors, such as George Eastman (Kodak camera), William S. Burroughs (adding machine), Isaac Singer (sewing machine), Alexander Graham Bell (telephone), and Thomas Edison (incandescent light bulb, phonograph, motion picture camera, mimeograph machine, and more) went on to become business giants. Less well known were the many women, immigrant, and African American inventors who filed thousands of patents in this period. For example, Jan Matzeliger, an immigrant of African and Dutch heritage from South America, invented a machine that simplified the most difficult and time-consuming step in the making of shoes (16.2). While much of shoemaking had become mechanized by the 1880s, the difficult "lasting" process—attaching the upper portion of a shoe to the sole—could only be done by hand.

Matzeliger's lasting machine (patented in 1883) was a remarkably complex device, yet was easy for unskilled workers to operate, allowing manufacturers to greatly boost production while slashing costs.

Government policy likewise played a key role in furthering American industrialization. The federal government and the states extended substantial support to railroad projects that totaled almost 180 million acres in land grants and \$500 million in loans and tax breaks (see Chapters 13 and 15). Public officials, in an argument later used to justify government support for the Interstate highway system and the Internet, defended this largess by arguing that railroads generated economic growth that benefited everyone from travelers to farmers to manufacturers. High federal tariffs that raised the price of imported goods, thereby helping domestic manufacturers, represented another government policy that promoted industrialization.

Yet the government also promoted industrialization by inaction. Public officials, business leaders, and conservatives subscribed to the philosophy of *laissez-faire* (French for "let do" or leave alone), which argued that the government should impose no restraints on business, including workers' demands for laws to regulate the hours of work, safety conditions, and wages. Government officials also



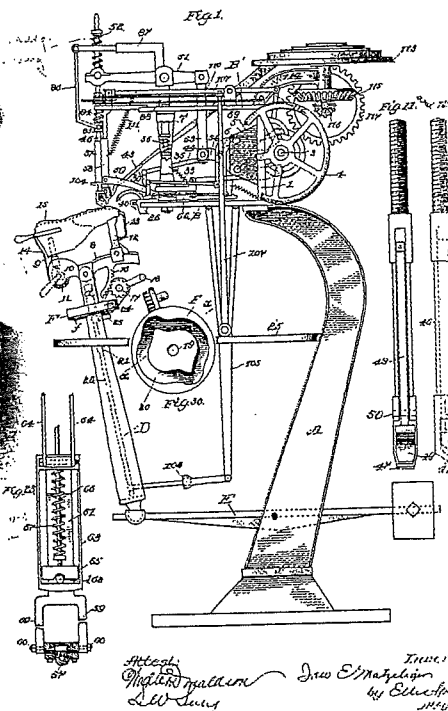
(No Model.)

J. E. MATZELIGER.  
LASTING MACHINE.

7 Sheets—Sheet 1.

No. 274,207.

Patented Mar. 20, 1883.



## 16.2 The Matzeliger Lasting Machine

Jan Matzeliger's complex sewing machine wiped out jobs for skilled shoe "lasters," who had hand-stitched shoe tops to soles, but allowed for a huge increase in mechanized shoe production.

ignored reformers' demands for statutes curbing cutthroat business practices and the establishment of an income tax. As Thomas Nast's political cartoon vividly shows (16.3), business and government leaders argued government interference harmed the American economy, depicted here as a woman weighed down by government-imposed burdens such as income taxes, laws (regulations), and "ideal" money (money not backed by gold). The closed shop and idle ship in the background and the vulture circling overhead all suggested these policies would kill the economy. Widespread support for *laissez-faire* among lawmakers left capitalists to operate in a market free of the restraints of government regulation.

## 16.3 Defending Laissez-Faire

This 1878 cartoon warns that government interference with the economy threatens the well-being of the nation.



## The Railroads

The most dramatic change in the late nineteenth-century industrial economy was the emergence of large corporations, business organizations established by a group of individuals and owned by people who buy shares of stock in the company. Before the Civil War, most American manufacturers were small-scale operations with fewer than twenty-five employees. They were usually privately owned and sold their products within a few hundred miles of where they were made. All this changed after 1865, as entrepreneurs, seeking bigger markets and greater profits that they could now reach thanks to the railroad and telegraph, began to form massive corporations that boasted thousands of employees in a single factory complex, operations in several states, and millions of dollars of investment capital raised from the sales of stock.

The original big businesses were railroads, and they played a key role in transforming the United States into an industrial power. In 1865 there were scores of small railroad companies scattered throughout the Northeast and Midwest and, to a lesser extent, the South. Comprising 35,000 miles of track, they serviced small areas and established their own standards for things such as track gauge (the distance between the rails). Nearly all suffered from financial instability and poor management. But by 1900, this haphazard system had developed into a massive, consolidated, and integrated national railroad network of 193,000 miles dominated by just seven large corporations.

Railroads grew at such a ferocious pace because they could be built almost anywhere, creating a transportation network no longer confined to meandering rivers and expensive, slow-to-construct canals that often froze in winter. The railroad also offered another great advantage: speed. People, mail, and goods traveling by stagecoach might, on a good day, cover 50 miles. A steam locomotive pulling many times more people, mail, and goods could cover the same distance in less than two hours. And after the completion of the first of several transcontinental lines in 1869 (see map 15.7) the railroad offered service from coast to coast.

The railroad meant more quick and cheap transportation, both boosts for the national economy. Wherever railroads were built new areas of settlement opened. Farmers settled on nearby land, often sold to them by the railroad company, confident that they could get their agricultural produce to market.

Shopkeepers, artisans, laborers, and railroad employees (one million by 1900) settled in towns that sprang up along the tracks. In turn they became consumers of finished goods brought by the railroad from eastern manufacturers. The railroad industry also contributed to the national economy by consuming large quantities of iron, steel, coal, and wood.

Fierce competition among railroads initially led to the rapid expansion of lines. By the 1870s, many railroads tried to diminish competition by buying out rival railroads, leading to the creation of giant corporations such as the Pennsylvania Railroad and the New York Central Railroad. Both owned thousands of miles of track in many states, employed tens of thousands of workers, and handled millions of dollars in investment capital and revenue.

## Modern Business Practices

The success of the large railroad corporations led to the modernization of business practices in two important ways. First, railroad corporations allowed other types of businesses to see the advantages of incorporating and issuing stock. Stock sales allowed corporations to raise capital to expand the business (for example, to buy new and more efficient equipment, or to buy a rival company). If the company earned a profit, stockholders benefited from an increase in the value of the stock (which they could sell for a profit) and sometimes by earning dividends. Stockholders played no direct role in running a company; a professional management team performed that function. But stockholders also enjoyed “limited liability”: If the company failed they were not liable for any of its debts or obligations, but they stood to lose only their shares. By the 1870s increasing numbers of companies involved in manufacturing, mining, communications, and finance had incorporated.

Second, the sudden emergence of huge railroad corporations operating in many states, employing thousands of workers, and handling millions of dollars encouraged the development of modern, sophisticated management practices. Chief among these practices was standardization. For example, in 1883, the nation’s major railroads established the four time zones that are still in use today. This decision helped to combat the problem of irregular “local time” (for example, when local time in New York City was 12:00 p.m., it was 11:55 a.m. in Philadelphia and 11:47 in Washington, D.C.) that

2.

How did railroad grants both reflect and promote national economic growth?

“Railroad time, it appears, is to be the time of the future. And so, people will now have to marry and die by railroad time. Ministers will preach by railroad time, and banks will be required to open and close by the same time. The sun is no longer the boss of the job.”

*Indianapolis Sentinel, 1883*

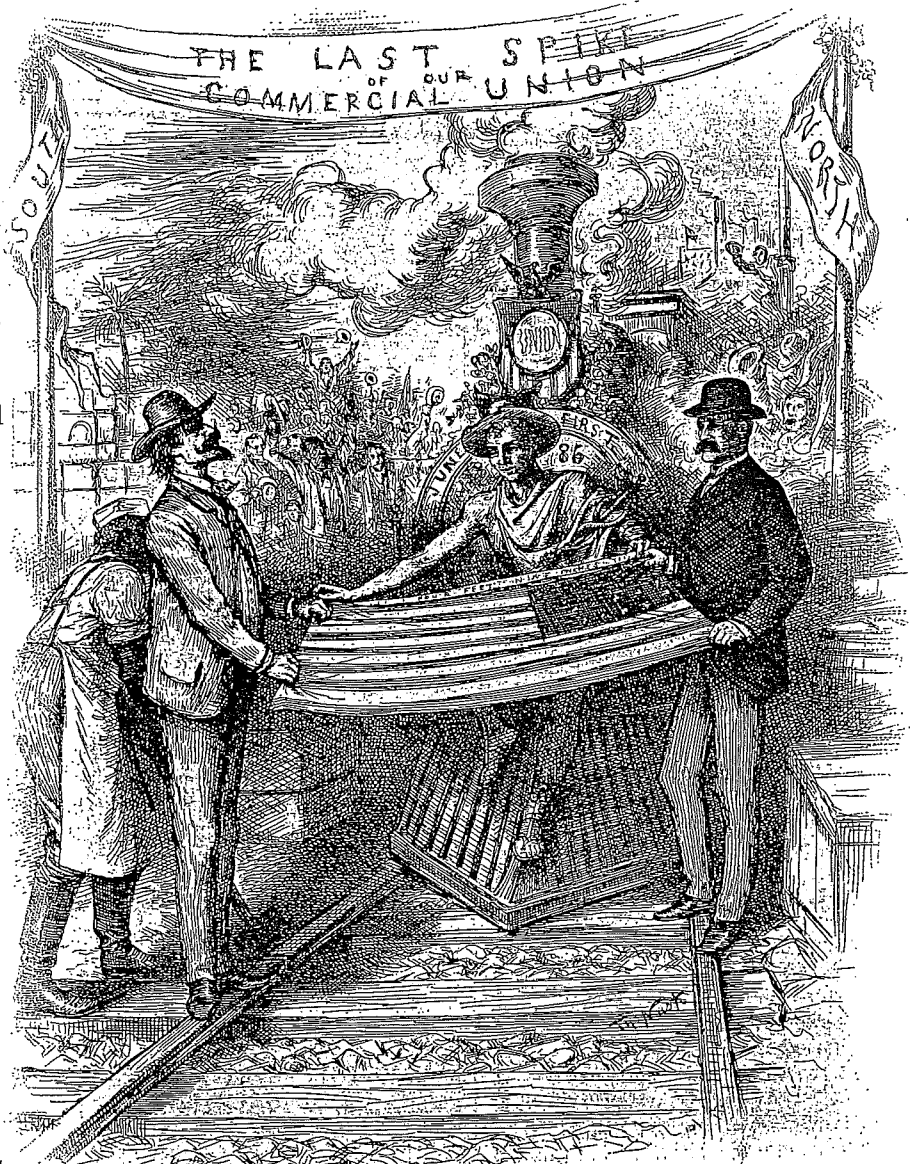
often led to costly accidents between trains sharing a single track or crossing at a junction.

Similarly, the development of standardized equipment like couplers, signals, and brakes allowed for easier operation and maintenance of a railroad's growing fleet of rolling stock. In 1886 the railroads also established a standard gauge for track of 4 feet 8.5 inches, thereby eliminating costly delays caused by the need to transfer cargo from one train to another wherever tracks of two different gauges met. As this drawing (16.4) indicates, many Americans viewed standard gauge as bringing both economic and political benefits to the nation, since it promised to create both a more efficient railroad system and greater unity between the less developed South (see chapter 14) with the rapidly industrializing North. The banner “The Last Spike in Our Commercial Union” likens the event to the 1869 completion of the transcontinental railroad.

To oversee these vast commercial operations—the largest in the world—executives of the major railroads, such as Jay Gould, Tom Scott, and Collis B. Huntington, developed complex hierarchies of superintendents, managers, and clerks and new systems of accounting, advertising information management, and pricing. Other big businesses, such as steel, oil, manufacturing, and retailing, soon copied these organizational practices, making them the norm in most large corporations.

## Rising Concern over Corporate Power

Americans greeted the astonishing spread of the railroad with mixed feelings. Many agreed with poet Walt Whitman, who celebrated the railroad as “the modern emblem of motion and power—the pulse of the continent.” They delighted in the benefits of inexpensive and speedy travel and increased access to finished goods in new mail order catalogs.



OUR STANDARD (GAUGE) ADOPTED ALL OVER THE UNION.

### 16.4 Celebrating the Standard Gauge, 1886

In this imagined scene Northerners and Southerners celebrate the adoption of a standard rail gauge as a measure destined to bind the country together economically.



**16.5 Demonizing the Monopoly**  
Americans grew increasingly worried about the rising power of railroads, the largest of which were often criticized as monopolies that strangled their competition.

Yet many Americans worried about the larger implications of the railroad. The cartoon depicting the Southern Pacific Railroad as a ravenous octopus (16.5) expressed their concern. The railroads and the fabulously wealthy men who ran them (shown in the eyes of the octopus) wielded immense power. The artist labeled the octopus a **monopoly**, a popular term to describe the control of an industry or market by one corporation. Was such unchecked power vested in the hands of so few people, worried the critics, compatible with the nation's republican principles? Many feared it was not—especially when it became clear that railroad executives routinely used their wealth to bribe state legislatures, members of Congress, and cabinet officials. Additional

revelations of stock manipulation, price gouging of farmers and manufacturers, exploitation of workers, and shoddy construction and unsafe operation added to the railroad's tarnished image and fueled concerted efforts to curb its power. Although few critics raised the issue at the time, later generations decried the railroad for its role in hastening the defeat of the Plains Indians and the near extermination of buffalo upon which they depended (see Chapter 15).

Growing anxiety and anger over the abusive practices of many large railroads eventually compelled reformers to seek tighter regulation of the industry. Given the immense power and wealth of the railroad and a general reluctance among politicians to regulate business, reform faced many setbacks. Farmers, bitterly opposing the high rates charged by railroads to transport and store agricultural commodities, led the first significant effort to curb laissez-faire business practices. Known as the Grange (see Chapter 15) it led a successful political movement in the 1870s to pass numerous laws regulating prices and outlawing unfair business practices.

## Andrew Carnegie: Making Steel and Transforming the Corporation

Of all the new things produced by the explosion of industrial output after 1865, none was more important than steel. Many times stronger than iron, steel became the essential ingredient in the transformation of America into an industrial society, allowing for the construction of the railroad and telegraph networks and tall buildings called “skyscrapers.” Steel also allowed for the construction of huge factories, filled with powerful manufacturing machinery—made from steel, of course. Steel likewise accelerated the commercialization of American agriculture as the material that made possible sharp, durable, and deep-cutting plows and mechanical reapers. It also altered modern warfare, enabling the development of more accurate, powerful, and thus more deadly weapons. Steel, in short, was as influential and revolutionary a substance in the late nineteenth century as silicon (used to make computer chips) was to become in the late twentieth.

Steel was important in still another way, for it brought to prominence the single most influential big business man of the era, Andrew Carnegie.

Carnegie's success was all the more remarkable because of his humble origins. Born in Scotland in 1836, he immigrated to America with his family at the age of twelve. Settling in Pittsburgh they struggled to earn a living. Young Carnegie dropped out of school and took a job in a textile factory where he earned just \$1.20 per week. Bright and ambitious, Carnegie took night classes in accounting, taught himself telegraphy, and went to work for Western Union. In 1853 Pennsylvania Railroad regional supervisor and future company president, Thomas A. Scott, hired the seventeen-year-old to serve as his personal telegrapher and eventually private secretary. In this capacity, Carnegie learned every detail of modern business practices that the railroad was developing. With his higher salary, he invested in railroads, factories, and, increasingly, the iron and steel industries.

In 1870 while running a very successful company that built steel bridges, Carnegie decided to move entirely in steel production. He built his own steel works and, drawing upon his knowledge of railroad management, he followed obsessively one fundamental business principle: reducing production costs to the lowest possible level.

To achieve this goal, Carnegie hired the brightest executives, accountants, managers, scientists, and engineers. He also invested heavily in the latest technology. He was the first to invest in the breakthrough Bessemer-Kelly process, a method of making exceptionally strong steel quickly and at low cost (in part due to reducing the need for skilled metalworkers).

Carnegie's focus on cost control led him to pioneer what is in the business practice known as vertical integration, the organization of a business by which one company controls all the main phases of production, from acquiring raw materials to retailing the finished product. Other industrial magnates who came to dominate their industries opted for a horizontal integration, a model where they bought out many companies producing the same product

to eliminate competition and achieve greater efficiency (16.6). To provide a steady supply of cheap coal, iron, and other essential raw materials that steel production depended on, Carnegie bought mines, smelting operations, railroads, and ships.

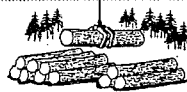
Finally, Carnegie pursued cutthroat practices to battle rival steel producers. To drive smaller rivals out of business, Carnegie slashed his prices to levels that bankrupted his competitors, allowing him to buy them out and gain a greater share of the market.

**VERTICAL INTEGRATION** Seeking to bring under one company the many different products and processes that go into the making of paper, Company A has acquired forests, logging companies, railroads, and chemical companies, as well as paper manufacturing plants. The advantages in this system are lower prices for and greater control over supplies of essential materials (such as wood pulp from trees).

#### Paper Company A Acquires



Forests  
(to supply pulp needed for paper)



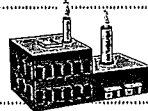
Logging Company  
(to harvest the trees)



Railroad  
(to bring lumber and chemicals to the paper factory and to ship the finished product to market)



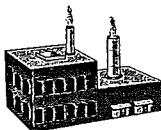
Chemical Company  
(to manufacture chemicals like bleach needed to make paper)



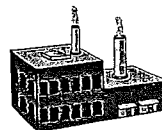
Paper Factory  
(to manufacture the paper from pulp)

**HORIZONTAL INTEGRATION** Seeking to gain the largest share of the market for paper products, Company B has acquired five more paper manufacturing companies. The advantage of this system is that Company B can generate more revenue from the added production and sales of paper products. It can also lower costs by eliminating redundant operations like advertising, marketing, and accounting in the acquired companies in favor of single operations covering these functions. Because of its increased size, the company can also lower costs by striking deals with suppliers (wood pulp, chemicals, etc.) eager for its business.

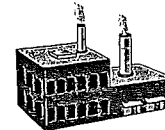
#### Paper Company B Acquires



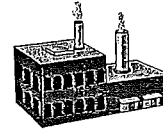
Paper Company



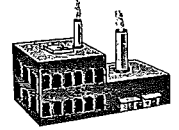
Paper Company



Paper Company



Paper Company



Paper Company

#### 16.6 Horizontal Integration versus Vertical Integration

Industrialists pursued two strategies when seeking to expand the size of their corporation. With vertical integration they sought to minimize costs and increase control of production by acquiring different kinds of companies involved in the chain of production. Through horizontal integration they attempted to reduce competition by acquiring their competitors.

5.

What policies contributed to Andrew Carnegie's success in business?

Like many other industrialists, he also signed secret deals with railroads, securing lower transportation rates for his steel than that charged by his competitors. Most of these tactics were legal at that time, but many critics considered them abusive.

The result of Carnegie's business policies was astonishing, bringing annual profits to \$40 million by 1900. By then Carnegie Steel was the largest corporation in the world, with more than twenty thousand employees and related operations in many countries. Carnegie's success was part of the much larger story of the "age of steel." By 1900 the U.S. steel industry employed 272,000 workers who that year produced 10.4 million tons of steel—an output more than twice that of its nearest rivals, Germany and Great Britain.

## Rockefeller and the Rise of the Trust

Carnegie was the most famous industrialist in the late nineteenth century, but countless others similarly led the way in developing key parts of the American economy. These included entrepreneurs like Philip Armour and Gustavus Swift (meat-packing), James B. Duke (tobacco products), George Eastman (Kodak camera) and Cyrus McCormick (farm equipment). Like Carnegie these industry leaders and thousands more succeeded by combining vision and ruthlessness, leading the public to both laud them as "captains of industry" who offered an ever-growing number of new products and services and denounce them as "robber barons," greedy capitalists who grew rich by devious business practices, exploitation of workers, and political manipulation.

The industrialist most frequently denounced as a robber baron was John D. Rockefeller. In many ways his rise to dominance in the oil industry resembled that of Andrew Carnegie. Through relentless cost-cutting, acquisition of new technology, hiring top-notch managers and scientists, and making secret deals with railroads to undermine his competition Rockefeller's Standard Oil company controlled more than 80 percent of the nation's oil-refining capacity by 1879. Unlike Carnegie, Rockefeller initially expanded his interests via horizontal integration (16.6), focusing almost exclusively on buying or building oil refineries. Later he followed Carnegie's vertical integration model as well, purchasing oil fields, railroad cars and warehouses, pipelines, and barrel factories.

Rockefeller's chief contribution to the rise of big business was the invention of two new forms of corporation management: the trust and the holding company. Like many industrial magnates, Rockefeller upheld the ideal of competition, but privately he believed competition between rival companies merely created waste and instability in the market. When so-called pools—secret deals between ostensibly rival companies to set production limits to keep prices high and award each participant a certain share of the market—inevitably failed, Rockefeller devised the trust.

Unlike pools, which lacked any legal basis and thus carried no penalty for cheating, trusts were legally binding arrangements that brought many companies in the same industry under the direction of a single board of "trustees." To join a trust, a company turned over to a board a majority of its stock in exchange for trust certificates, which guaranteed it a share of the profits. Rockefeller's Standard Oil Trust, for example, consisted of forty companies under the direction of a nine-member board of trustees selected by Rockefeller himself. As profits soared, dozens of trusts in other industries, such as sugar, lead, cotton, and oil, were formed, although not all successfully.

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**"Honest labor never rusts:  
up with labor down with trusts."**

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Banner in 1889 Boston Labor Day Parade

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The rapid emergence of giant trusts, as with the rise of large railroads, alarmed many Americans. Fueling this rising concern was the unwillingness of Congress and the Supreme Court to curb the power of big business. In 1886 the very conservative Supreme Court declared that state railroad commissions did not have the authority to impose regulations on railroads because only Congress had the right to regulate interstate commerce (*Wabash, St. Louis & Pacific Railway Co. v. Illinois*, 1886). In a separate case (*Santa Clara County v. Southern Pacific Railroad*, 1886), the court also declared that corporations were "de facto persons" and thus subject to all the protections under the Fourteenth Amendment. No state or local government, therefore, could impose limits on corporations "without due process of law"—in other words, approval by conservative federal courts.

The next year in 1887 Congress attempted to curtail the power of the railroads by establishing the Interstate Commerce Commission and making pools and rebates (special discounts by railroads to favored customers) illegal. But the ICC proved weak and ineffective, especially in the face of a conservative Supreme Court. Of the sixteen cases when railroads challenged a ruling by the ICC between 1887 and 1905, the Supreme Court sided with the railroads fifteen times.

Big business also benefited from enormous political influence in Congress. In this damning 1889 cartoon, *The Bosses of the Senate* (16.7), from the popular magazine *Puck*, the bloated trusts are clearly in charge. Congress was all too willing to do the bidding of corporate interests. Note that the doorway marked "People's Entrance" is boarded shut while a much larger "Entrance for Monopolists" is wide open. Note too the bitter conclusion that big business has subverted American democracy: "This is a Senate of the monopolists, by the monopolists, and for the monopolists."

The fate of the Sherman Anti-Trust Act of 1890 seemed to verify this conclusion. It was originally proposed as a law that empowered the Justice Department to prosecute any illegal contract, combination, or conspiracy among corporations

that was designed to eliminate competition or in any way restrain free trade. In other words the act made trusts illegal. But months of lobbying by corporate interests influenced Congress to word the final version of the act so vaguely that it was essentially unenforceable. As a result, the Justice Department prosecuted only eighteen antitrust cases between 1890 and 1904.

Rockefeller's other major corporate management innovation—the holding company—replaced the trust in the 1890s as the preferred big business model. The holding company was a huge corporation that bought and ran other corporations by purchasing their stock. Rockefeller's idea caught on immediately because it offered protection from the Sherman Act and allowed for the creation of enormous corporations, many of which exercised near monopoly control of the market. Corporate mergers occurred at an astonishing pace in the 1890s, so that by 1900 a mere 1 percent of corporations controlled 33 percent of the nation's manufacturing output, a figure that rose to 44 percent by 1910. The same was true of the railroads. In 1900 seven colossal railroads controlled two-thirds of the nation's track mileage. Big business, despite the best effort of reformers, was here to stay.

**16.7 The Political Power of the Trusts**  
Reformers criticized trusts for their power to bribe and bully Congress to pass favorable legislation. Here, a meek-looking Congress sits under the domineering gaze of the bloated trusts.

